

Change in Absolute Muscle Mass and Protein Content in
AEM Control, Flight and Hindlimb-suspended Animals

Group	Mass			Protein		
	Initial (mg)	Final (mg)	Change (%)	Initial (mg)	Final (mg)	Change (%)
Soleus						
AEM Control	22.9 ± 0.5	30.9 ± 0.7	35 ± 3	2.95 ± 0.06	4.23 ± 0.16	44 ± 3
Flight	27.3 ± 0.3	23.4 ± 0.8	-14 ± 2 ^a	3.43 ± 0.05	2.76 ± 0.09	-20 ± 2 ^a
Suspended	25.0 ± 0.2	19.1 ± 0.6	-23 ± 3 ^a	3.22 ± 0.02	2.50 ± 0.07	-23 ± 2 ^a
Plantaris						
AEM Control	41.4 ± 0.9	65.9 ± 3.6	60 ± 8	5.51 ± 0.11	7.83 ± 0.37	42 ± 3
Flight	49.3 ± 0.7	61.4 ± 2.8	25 ± 5 ^b	6.42 ± 0.08	8.40 ± 0.21	31 ± 2 ^c
Suspended	45.2 ± 0.4	55.6 ± 1.2	23 ± 3 ^b	6.02 ± 0.05	7.20 ± 0.08	20 ± 1 ^a
Gastrocnemius						
AEM Control	202 ± 4	307 ± 9	51 ± 3	25.3 ± 0.5	36.7 ± 1.4	45 ± 3
Flight	241 ± 3	313 ± 11	30 ± 5 ^b	33.7 ± 0.8	44.4 ± 2.3	31 ± 3 ^c
Suspended	221 ± 2	279 ± 4	26 ± 1 ^a	27.6 ± 0.3	33.2 ± 0.8	20 ± 3 ^b
Extensor Digitorum Longus						
AEM Control	24.6 ± 0.5	35.8 ± 0.7	43 ± 2	3.29 ± 0.07	4.84 ± 0.13	47 ± 5
Flight	29.3 ± 0.4	41.7 ± 1.1	43 ± 3 ^d	3.91 ± 0.05	5.66 ± 0.14	45 ± 3
Suspended	26.8 ± 0.2	35.4 ± 0.5	32 ± 2 ^c	3.60 ± 0.05	4.93 ± 0.12	37 ± 3
Tibialis Anterior						
AEM Control	95 ± 2	129 ± 3	36 ± 4	11.7 ± 0.2	16.3 ± 0.6	39 ± 3
Flight	113 ± 2	158 ± 6	39 ± 4	13.9 ± 0.2	20.1 ± 0.5	45 ± 3
Suspended	104 ± 1	133 ± 2	29 ± 2	12.7 ± 0.2	16.4 ± 0.5	29 ± 4

^ap<0.001 versus AEM control by ANOVA with Bonferroni correction

^bp<0.01 versus AEM control by ANOVA with Bonferroni correction

^cp<0.05 versus AEM control by ANOVA with Bonferroni correction

^dp<0.05 versus suspended by ANOVA with Bonferroni correction

AEM control animals (n=8) were housed in the Animal Enclosure Module at the University of Arizona animal facility under the same temperature conditions, light-dark cycle, and duration as flight animals (Tischler et al J. Appl. Physiol. 74:2161, 1993). The initial muscle mass and protein content for the time of loading (0930 h EDT on October 31, 1991) into the AEM were calculated from the actual animal body weight and the normalized mass and protein content (mg/100 g body weight) of each muscle type as determined in the time zero controls. Final values were determined at 6.3d after AEM loading which mimicked the total time flight animals spent in the AEM. Flight animals (n=8) were randomly assigned and loaded into their AEM at 2300 h EDT, September 11, 1991 (launch-21h). The initial muscle mass and protein content at the time of launch (1900 h EDT, September 12, 1991) were estimated from the actual animal body weight and the normalized mass and protein content (mg/100 g body weight) of each muscle type as determined in the time zero controls. The final values were determined, between 2h 8 min and 3h 22 min after landing. Suspended animals (n=7) were selected from the same

shipment as the AEM control group. The initial muscle mass and protein content at the time of suspension (2330 h EDT, October 30, 1991) were calculated from the actual animal body weight and the normalized mass and protein content (mg/100 g body weight) of each muscle type as determined in the time zero controls. Final values were determined after 5.5 d which was between 2 and 3 h after the animals were reloaded on their hindlimbs to parallel the flight animal conditions. Samples were prepared for protein analysis (Tischler et al J. Appl. Physiol. 74:2161, 1993) by the Lowry procedure (Lowry et al J. Biol. Chem. 193:265, 1951).